A Biogeographic Assessment of the Channel Islands National Marine Sanctuary & Surrounding Areas:

Final Status Report

A Presentation to the Sanctuary Advisory Council

By:
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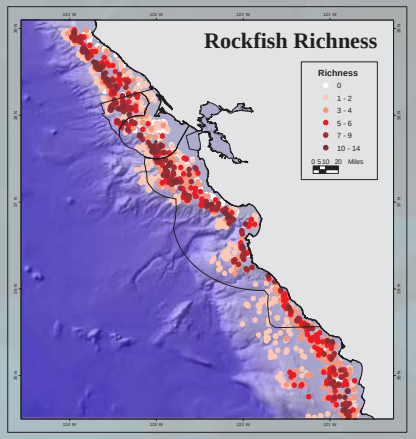
NOAA's National Centers for Coastal Ocean Science
Biogeography Program
May 20, 2005

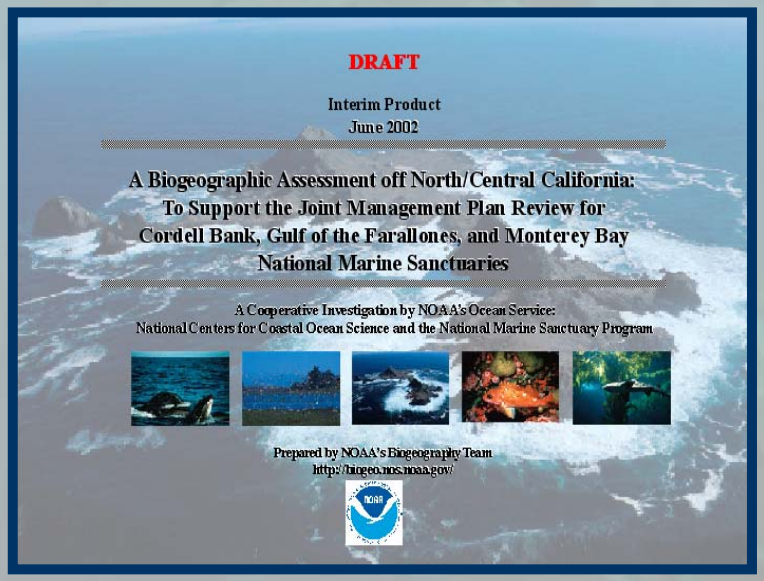
Why Us?

NOAA's National Centers for Coastal Ocean Science (NCCOS)

Mission: To provide Coastal Managers with scientific understanding and tools needed to balance NOAA's environmental, social, and economic goals.



Our Strengths:
robust spatial analysis and integrated assessments



NCCOS's Biogeography Program

Mission: Develop knowledge and products on living marine resource distributions and ecology throughout the Nation's estuarine, coastal and marine environments, and to provide managers and scientists with an improved ecosystem basis for making decisions

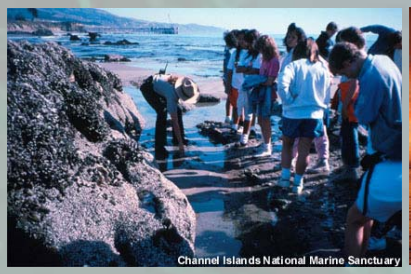
In the Beginning…

We need your guidance, and hope you will all choose to be involved throughout the duration of this project.

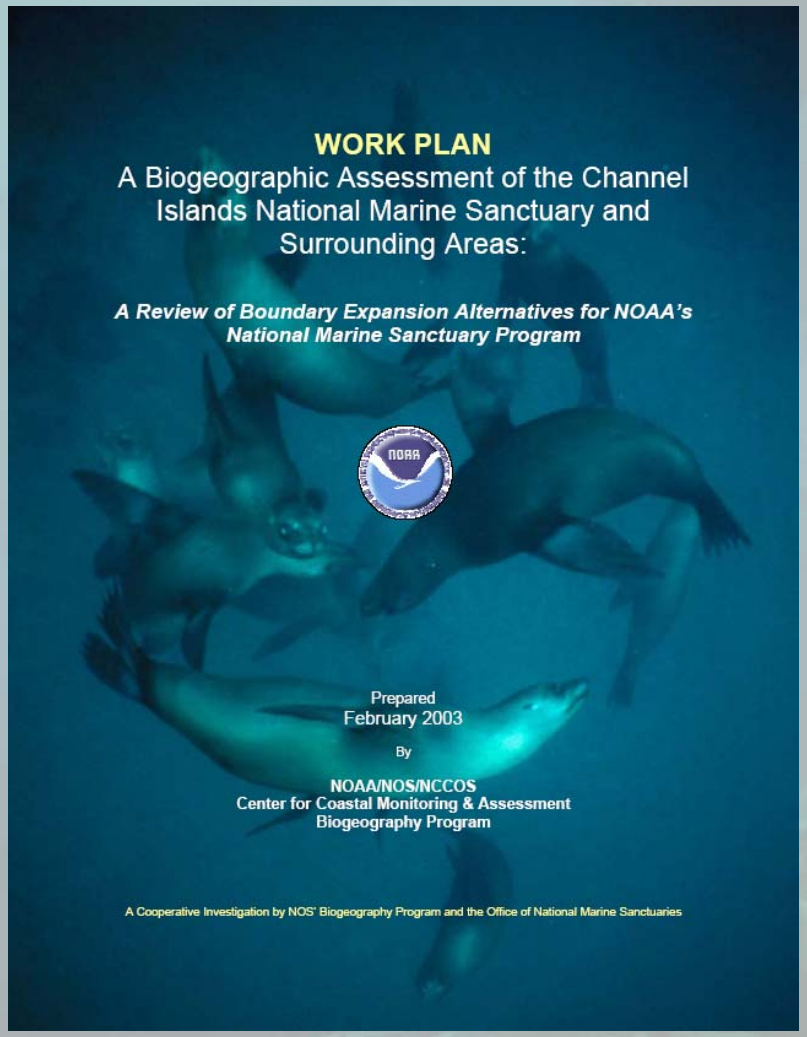
Are there specific biogeographic processes that you as a group feel we need to focus on?

Are there specific taxa, habitats, or other issues that we should pay particular attention to?

Are there any experts or other individuals that you feel we MUST contact to ensure we get the job done right?



The Work Plan



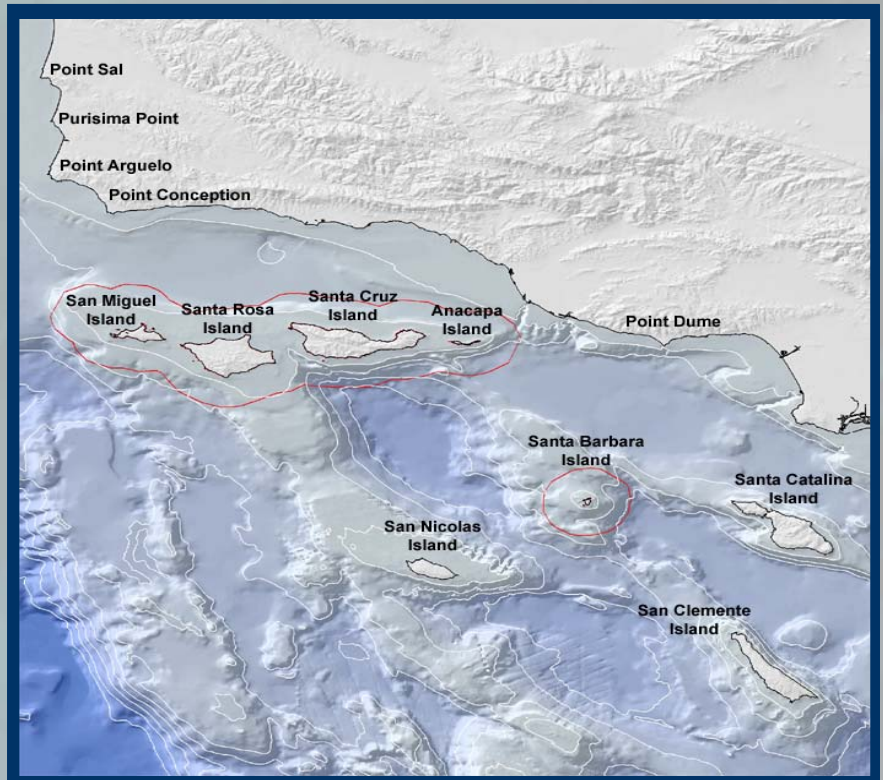
TASK SUMMARY

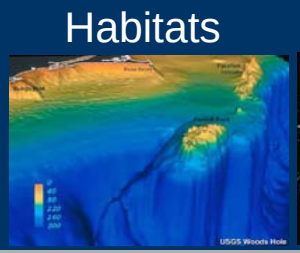
- Completed in February 2003
- Represents consensus project blueprint between NCCOS, CINMS, and NMSP
- Includes project objectives, tasks, and associated timelines, project personnel, and contact information
- Project work plan is available on the project web site:

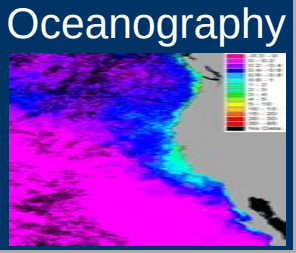
http://biogeo.nos.noaa.gov/projects/ca_nms/cinms

Questions to be Addressed in this Study:

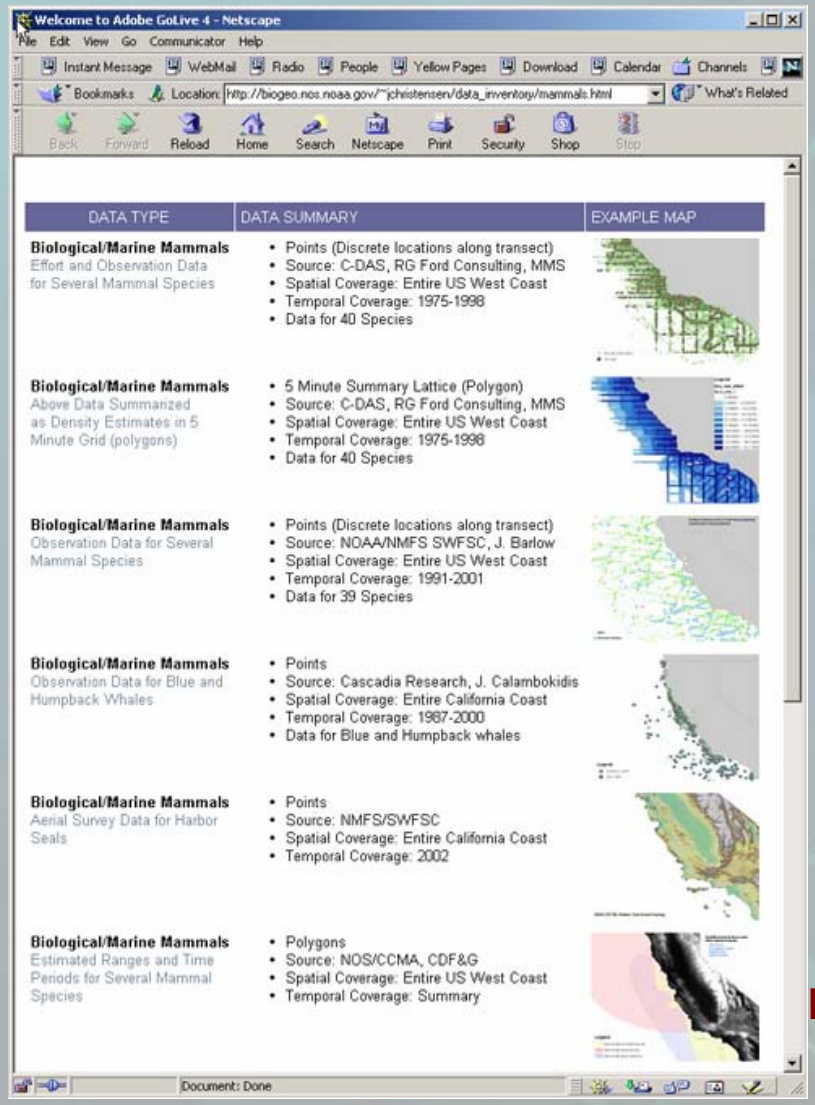
- **What data currently exists allowing us to identify regions spatially important to species or communities?**
- **Does analysis of the existing data reveal patterns or trends in the distribution of marine associated fauna?**
- **Where existing data is insufficient can we model the distribution of selected species to reveal useful distributional information?**
- **What can these patterns and trends tell us about the biogeography of the region in general?**
- **How do these patterns and trends relate to proposed Sanctuary boundary alternatives?**







Data Collection & Inventory



TASK SUMMARY

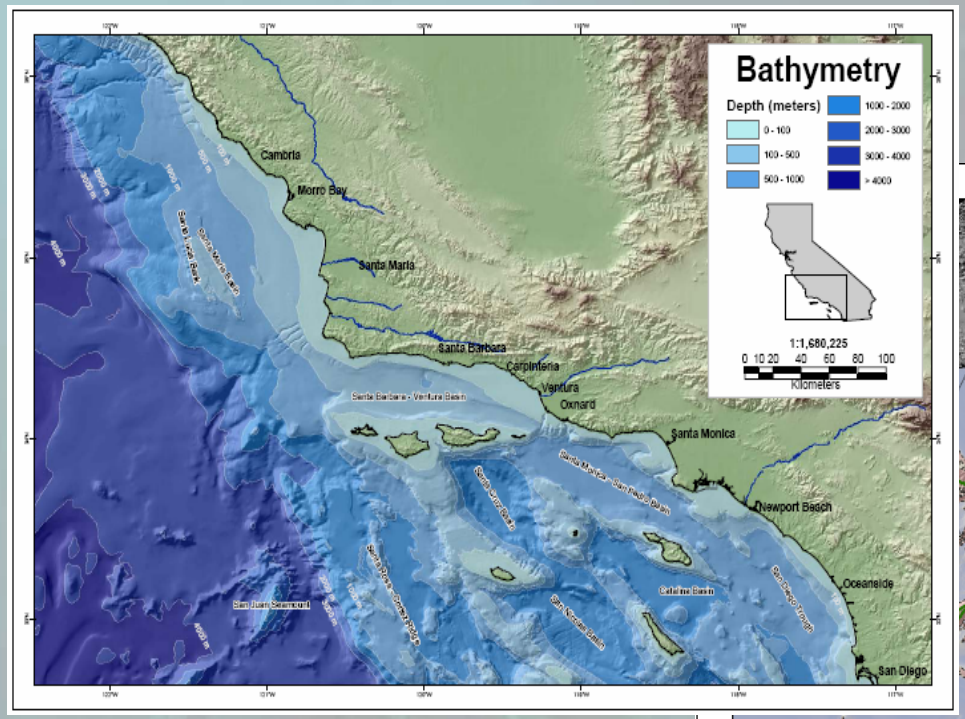
- A total of 47 spatially comprehensive datasets

- INCLUDING:
  - 10 Marine mammal datasets
  - 3 Marine bird datasets
  - 13 Fish datasets
  - 5 Invertebrate datasets
  - 3 Intertidal community datasets
  - 3 Habitat datasets (kelp, substrate, NWI)
  - 7 Physical oceanographic datasets

- Data inventory is available on the project web site:

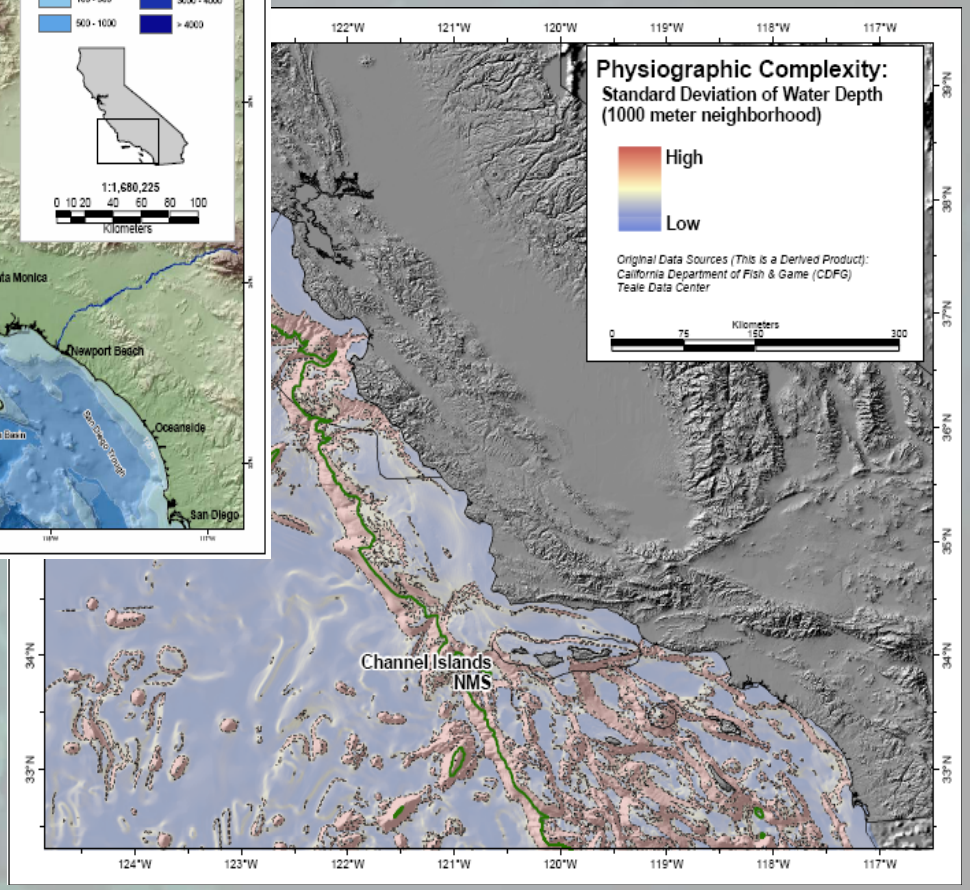
http://biogeo.nos.noaa.gov/projects/ca_nms/cinms

Physical Data - Bathymetry

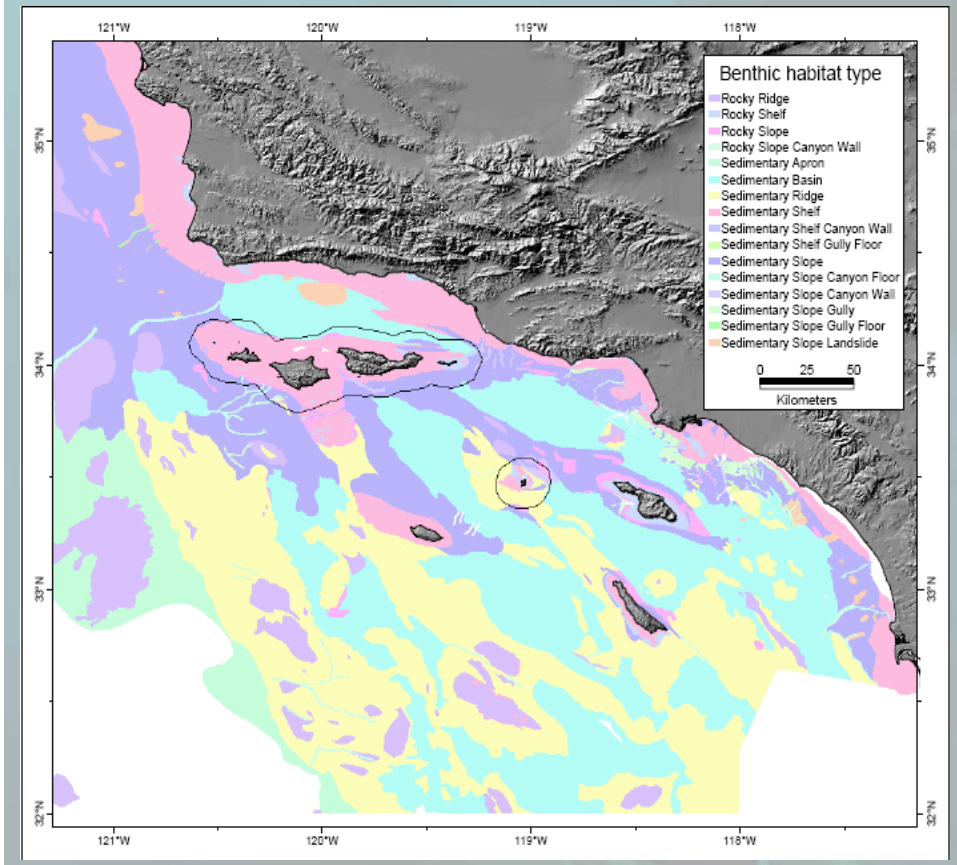


Bathymetry Contours

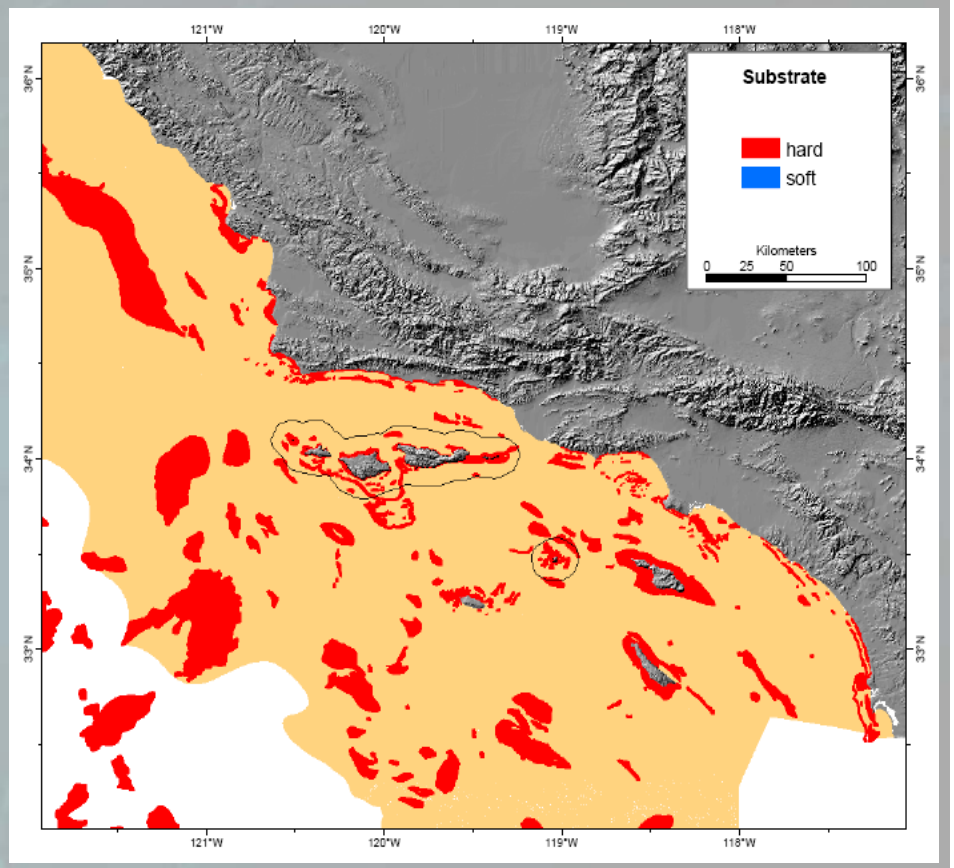
Bathymetric Variation



Physical Data – Benthic Substrate

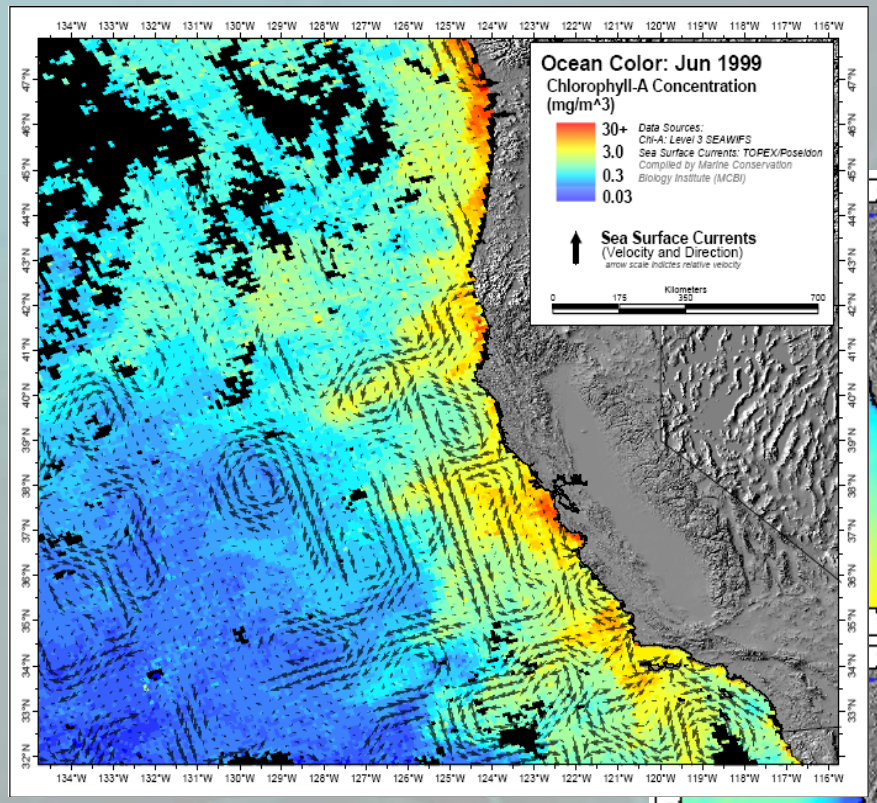


Source:
NMFS, 2004
Essential Fish Habitat EIS



Source:
NMFS, 2004
Essential Fish Habitat EIS
And MMS/UCSB

Physical Data – Oceanography

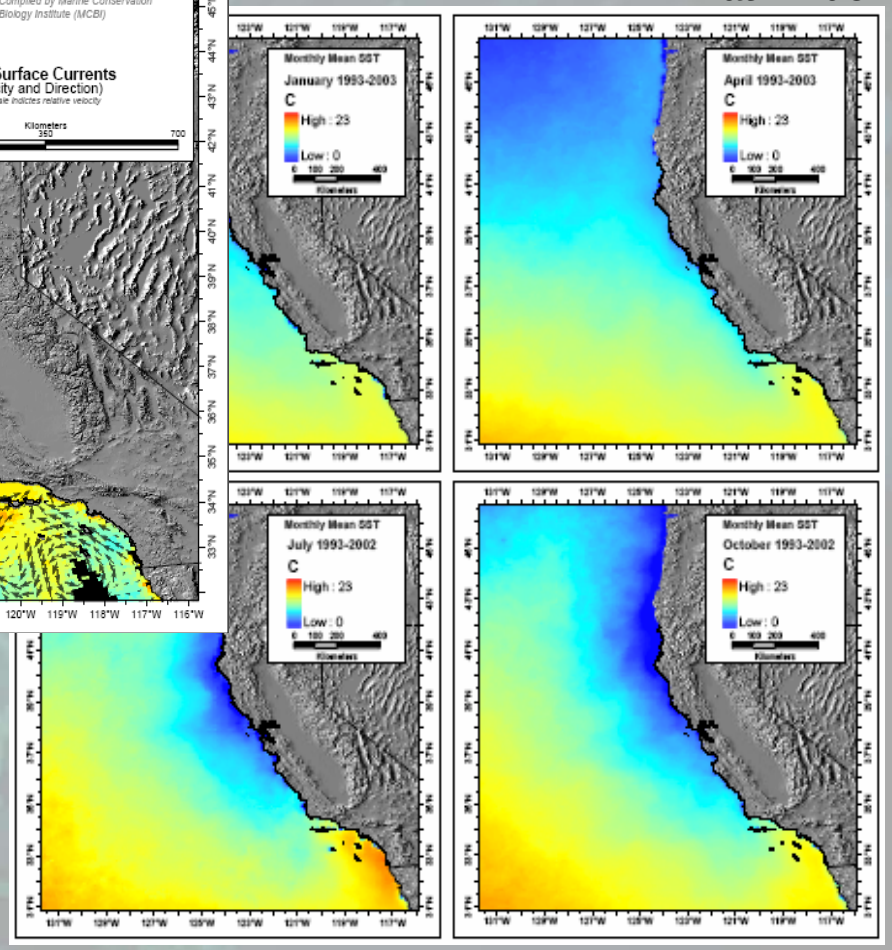


Chl a & Currents

Source:
Marine Conservation Biology Institute

SST

Source:
NOAA/NASA Pathfinder



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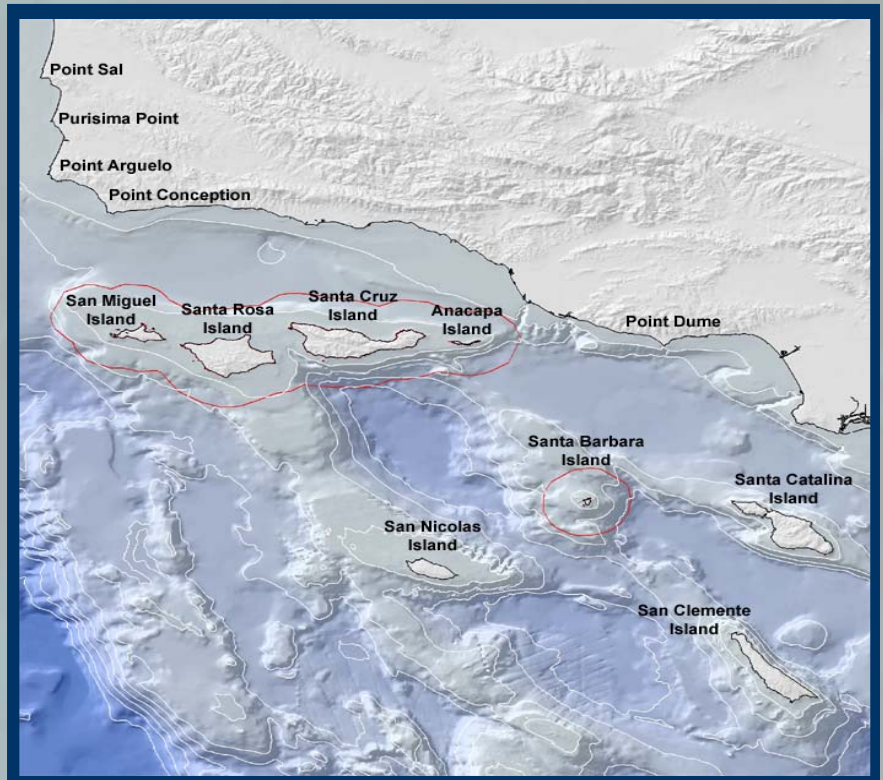
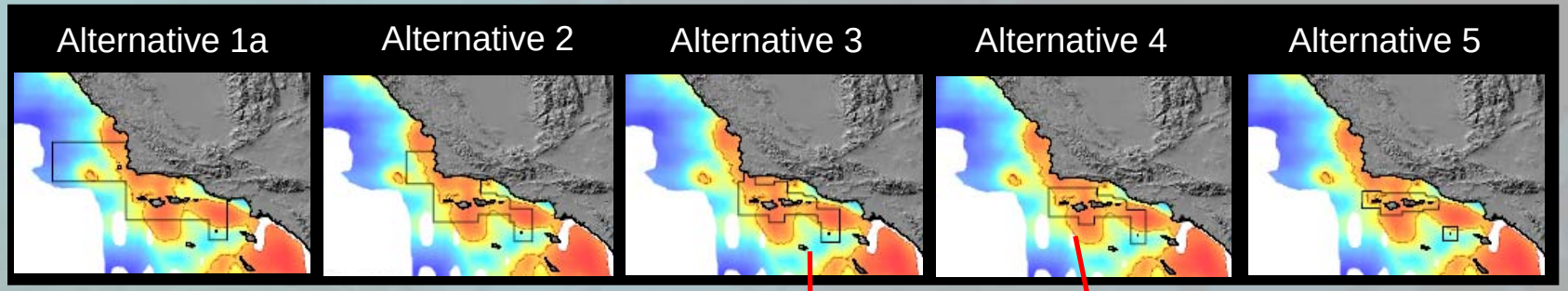


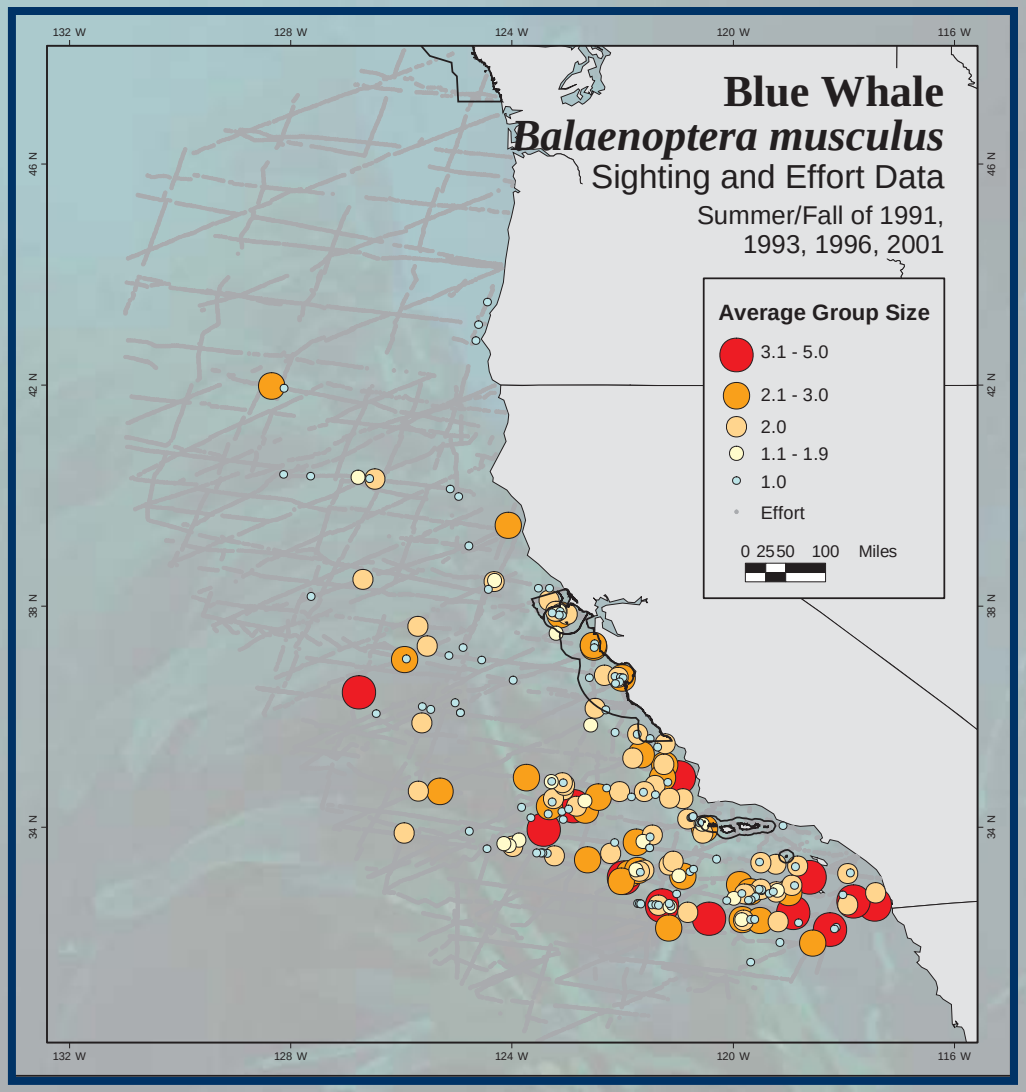
For the Love of Acronyms - OAI

Bang for your area buck!!

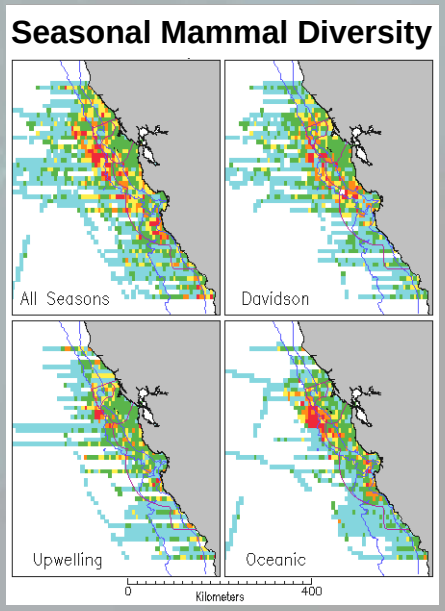


Alternative	Area (km²)	Mean Bird Diversity	High Diversity Area (km²)	Δ Area (%)	Δ Mean Diversity (%)	Δ High Diversiy Area (%)	Mean Bird Diversity OAI (relative)	High Diversity Area OAI (absolute)
NAA	3745	1.485	2284	-	-	-	-	-
5	4536	1.487	2812	21	0.13	23.12	0.00638	1.094
4	7981	1.523	5507	113	2.56	141.11	**0.02262**	1.248
3	9044	1.53	6421	141	3.03	181.13	0.02141	**1.28**
2	13736	1.502	8791	267	1.14	284.89	0.00429	1.068
1a	22591	1.372	10391	503	-7.61	354.95	-0.01512	0.705
1	22613	1.375	10401	504	-7.41	355.39	-0.0147	0.705
SA	17093	1.489	9914	356	0.27	334.06	0.00076	0.937

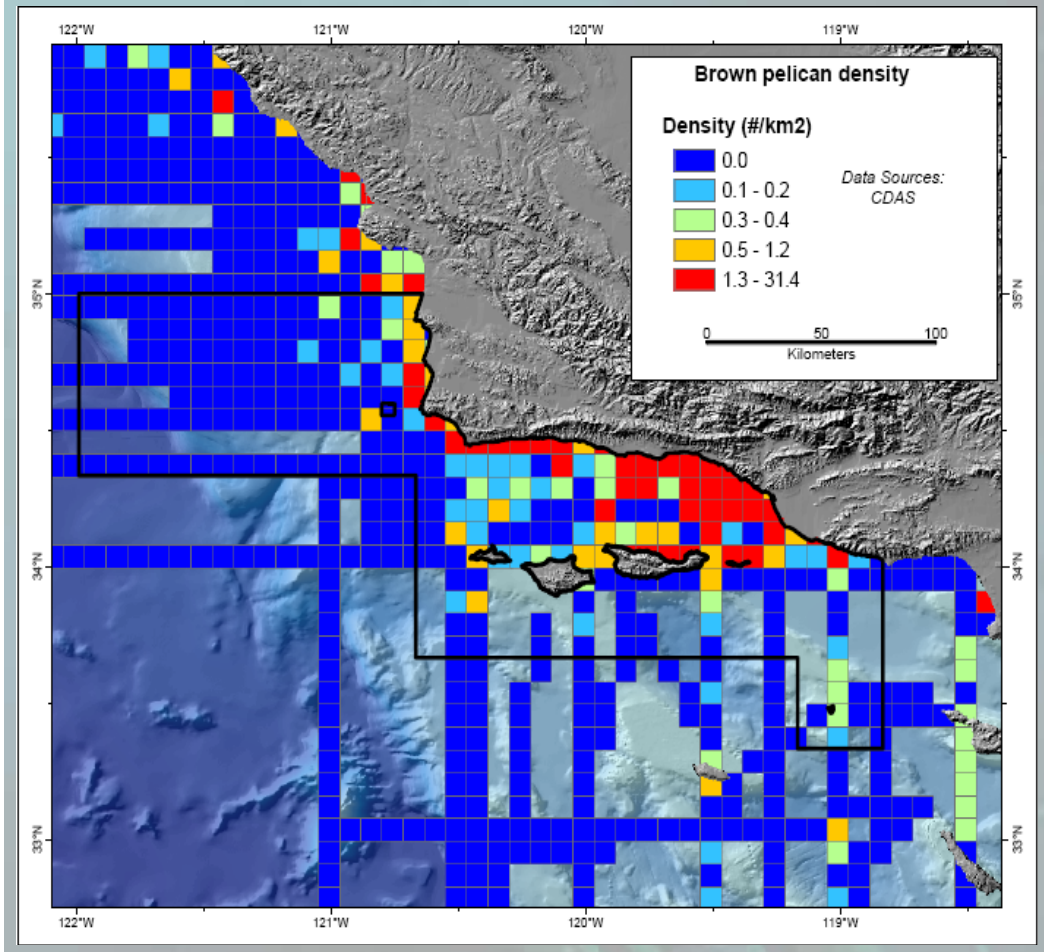
Biological Data – Mammals & Birds



- CDAS database, a compilation of aerial & vessel surveys from 1975-1997
- Seasonal density estimates (Davidson, Oceanic, etc.)
- Measures of mammal community structure (Richness, Diversity)



Biological Data – Sea/Shorebirds

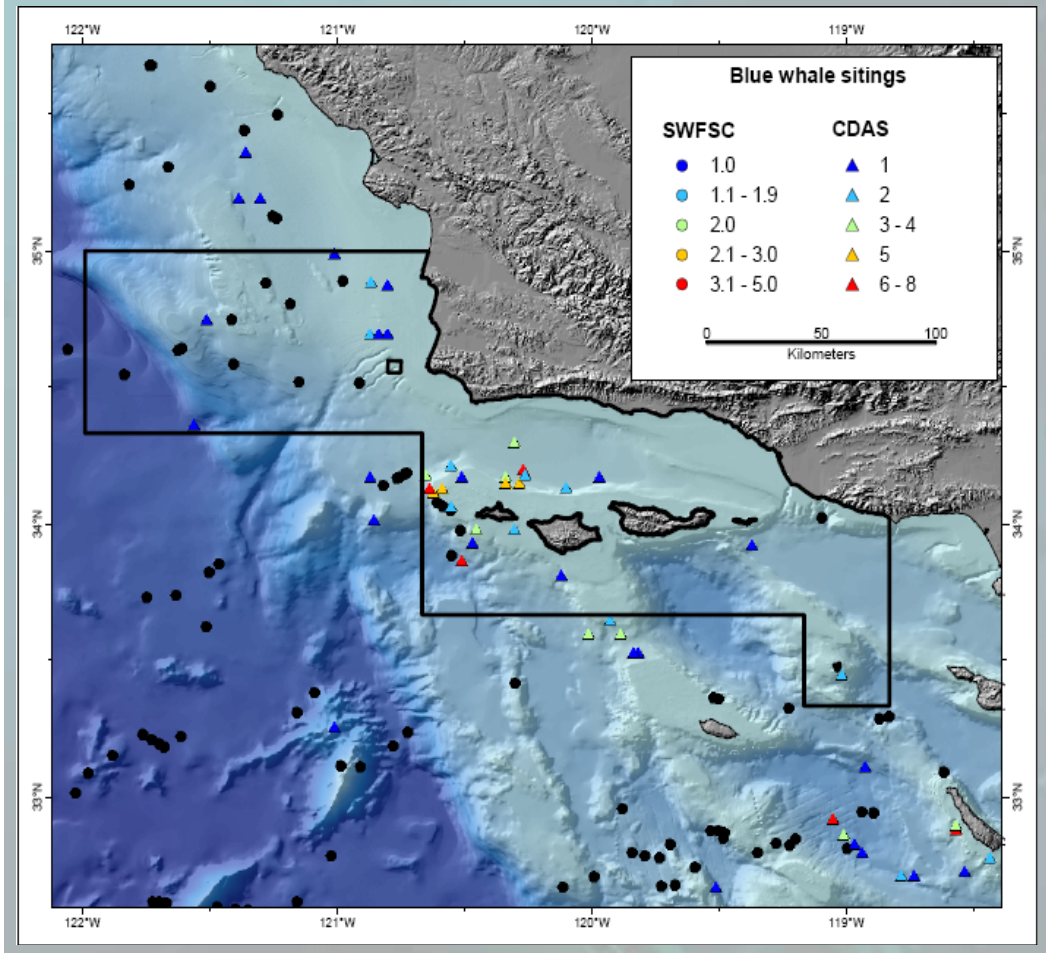


Results
11 Birds
Single species – Brown pelican

Alternative	Total Individuals	Density (Individuals per km²)	Area (km²)	Absolute OAI	Relative OAI
NAA	374	0.834	3745	-	-
5	452	**0.918**	4536	0.99	**0.47**
4	540	0.722	7981	0.39	-0.12
3	913	**0.927**	9044	1.02	0.08
2	1355	**0.853**	13736	0.98	0.01
1a	2546	**1.035**	22591	**1.15**	0.05
1	2546	**1.035**	22613	**1.15**	0.05
SA	2546	**1.204**	17093	1.63	0.12

Source:
MMS, 2001
Computer Database Analysis System (CDAS)
1975-1997

Biological Data – Marine Mammals

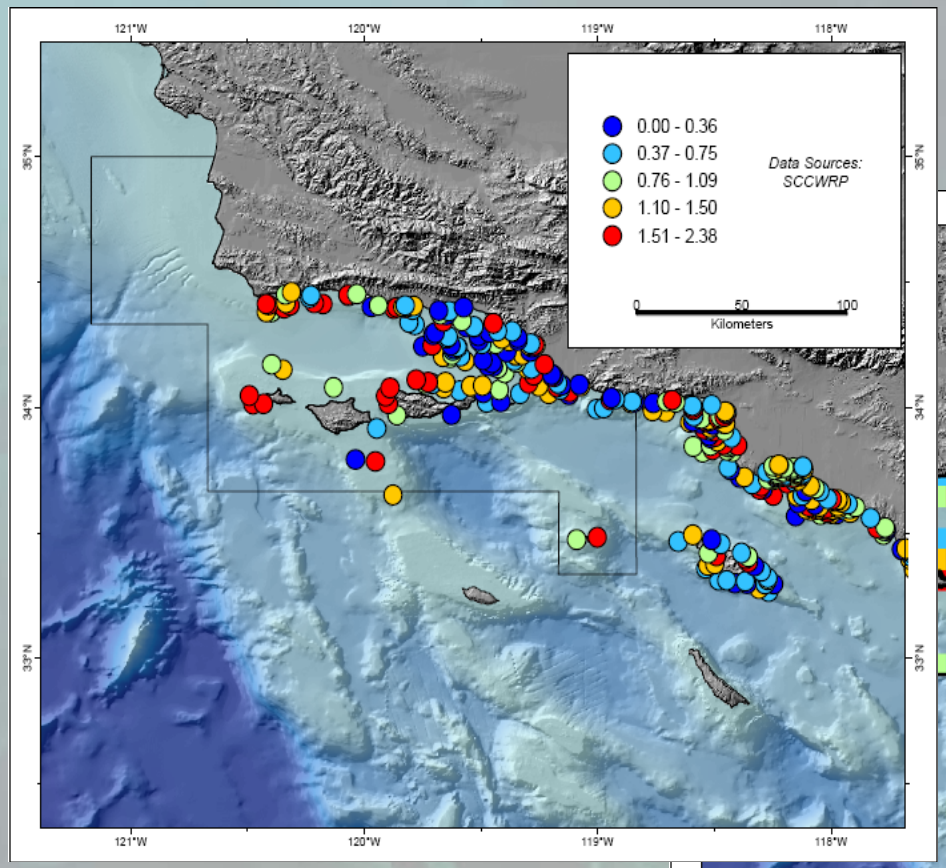


Results:
9 Marine Mammals
Single species – Blue whale

Alt	Area (km²)	Density	Estimated Abundance	Density OAI (relative)	Abundance OAI (absolute)
NAA	3745	0.00807	30	-	-
5	4536	0.00712	32	-0.557	0.316
4	7981	0.004	32	-0.446	0.059
3	9044	0.00358	32	-0.393	0.047
2	13736	0.006	82	-0.096	0.65
1a	22591	0.00587	133	-0.054	0.68
1	22613	0.00587	133	-0.054	0.681
SA	17093	0.0053	91	-0.095	0.57

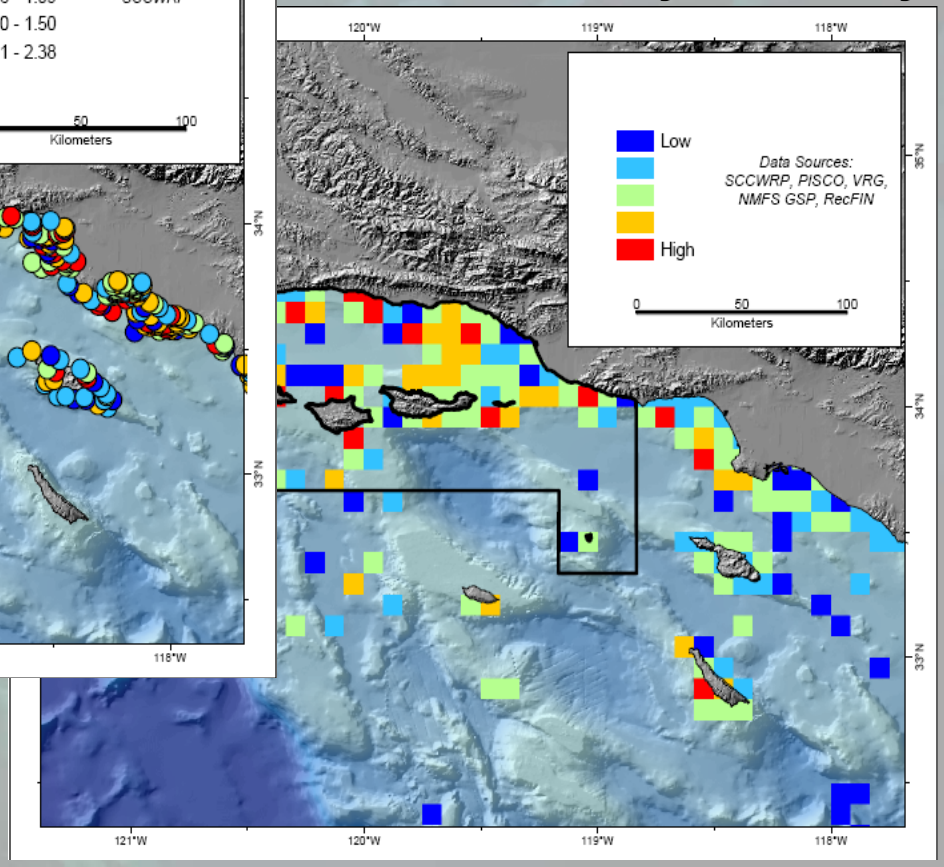
Source:
SWFSC 1999-2001
MMS (CDAS) 1975-1997

Biological Data – Fish & Inverts



Macroinvertebrate Community Diversity

Fish Community Diversity



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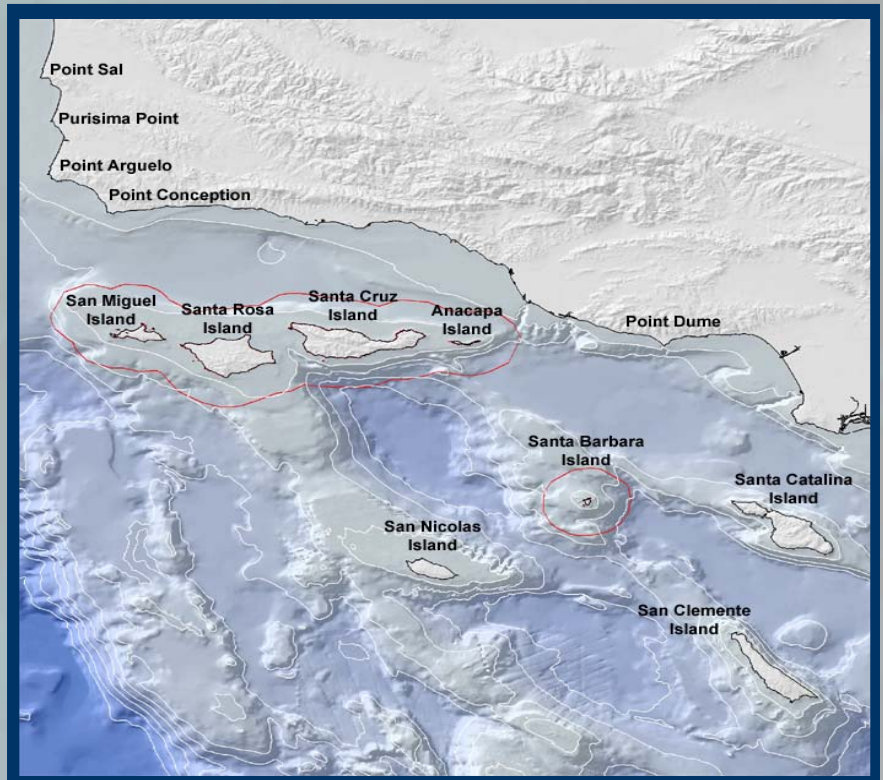
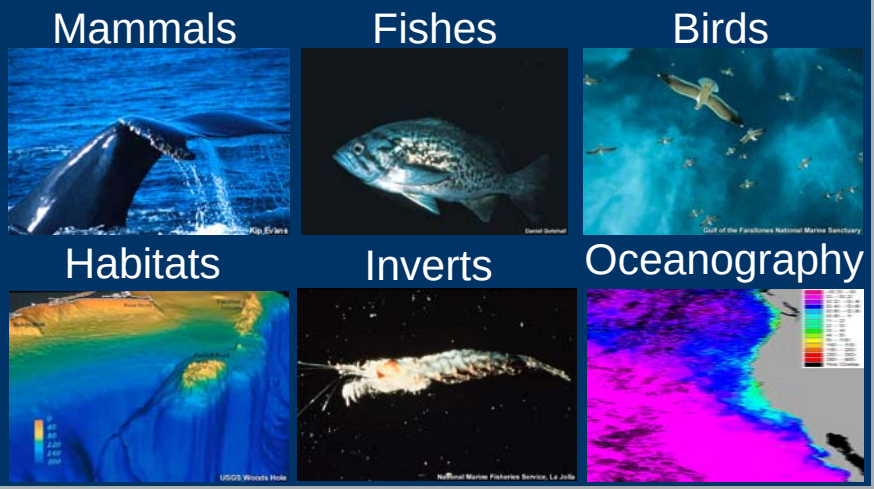
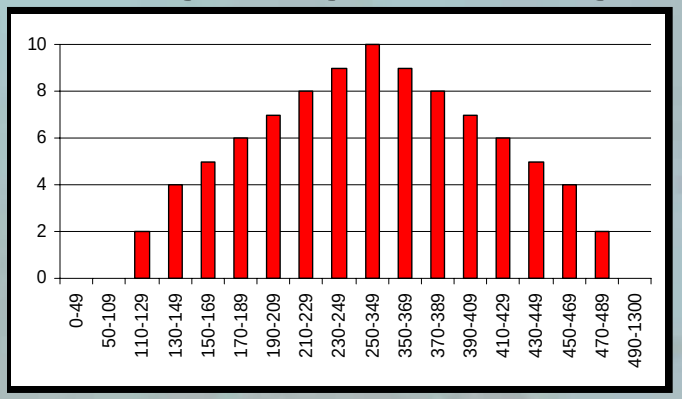


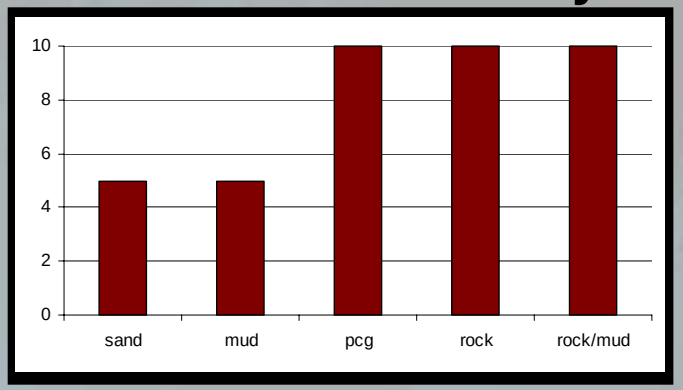


Habitat Suitability Modeling

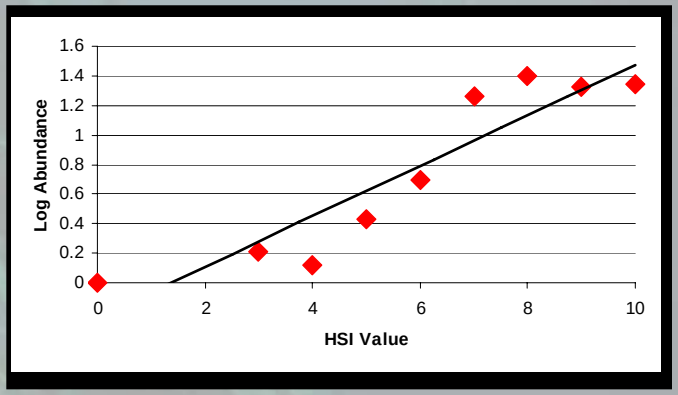
Bathymetry Suitability



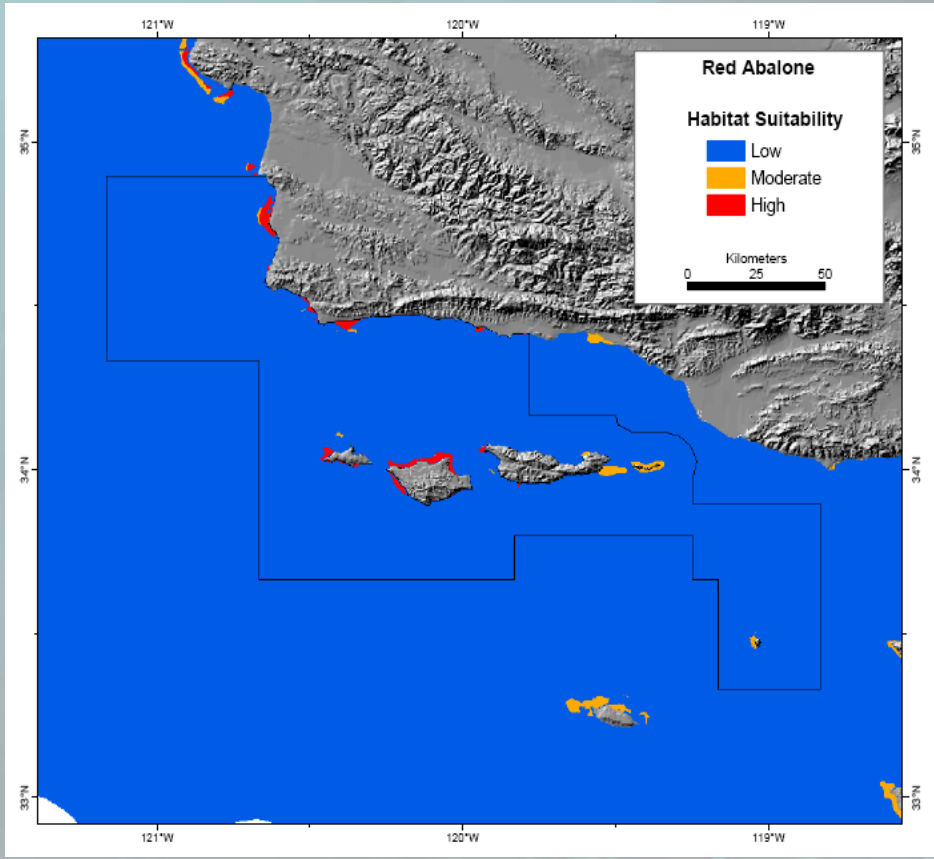
Substrate Suitability



HSI Results - Validation



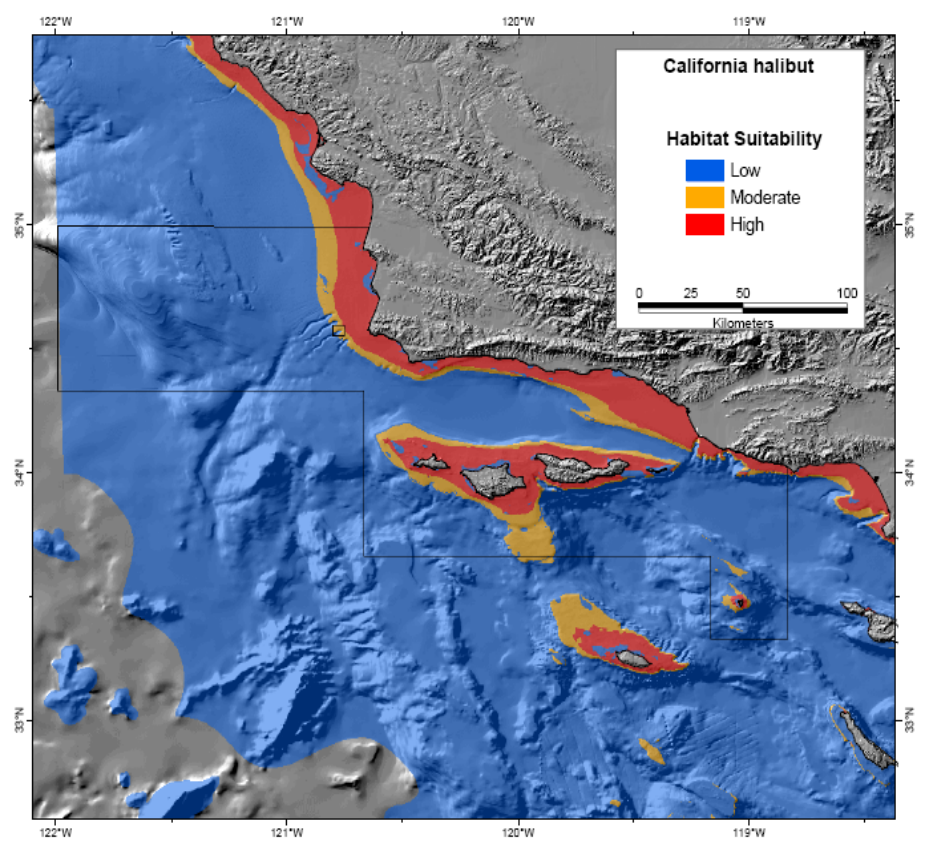
Biological Data – Invertebrates



Results
15 Macroinvertebrates
Single species – Red abalone

Alternative	Area (km²)	High Suitability Area (km²)	Δ Area (%)	Δ High Suitability Area (%)	OAI (absolute)
NAA	3745	123	-	-	-
5	4536	123	21.12	0.00	0.00
4	7981	123	113.11	0.00	0.00
3	9044	**148**	141.50	20.33	0.14
2	**13736**	**230**	**266.78**	**86.99**	**0.33**
1a	22613	**241**	503.82	95.93	0.19
1	22591	**241**	503.23	95.93	0.19
SA	17093	**241**	356.42	95.93	0.27

Biological Data – Fishes



Results
12 Fish
Single species – California halibut

Alt	Area (km²)	High Suitability Area (km²)	Δ Area (%)	Δ High Suitability Area (%)	OAI (absolute)
NAA	3745	1194	-	-	-
5	4536	**1201**	21.12	0.59	0.03
4	7981	**1201**	113.11	0.59	0.01
3	9044	**1310**	141.50	9.72	0.07
2	13736	**2157**	266.78	80.65	0.30
1	22613	**3237**	503.82	171.11	**0.34**
1a	22591	**3234**	503.23	170.85	**0.34**
SA	17093	3237	356.42	171.11	0.48

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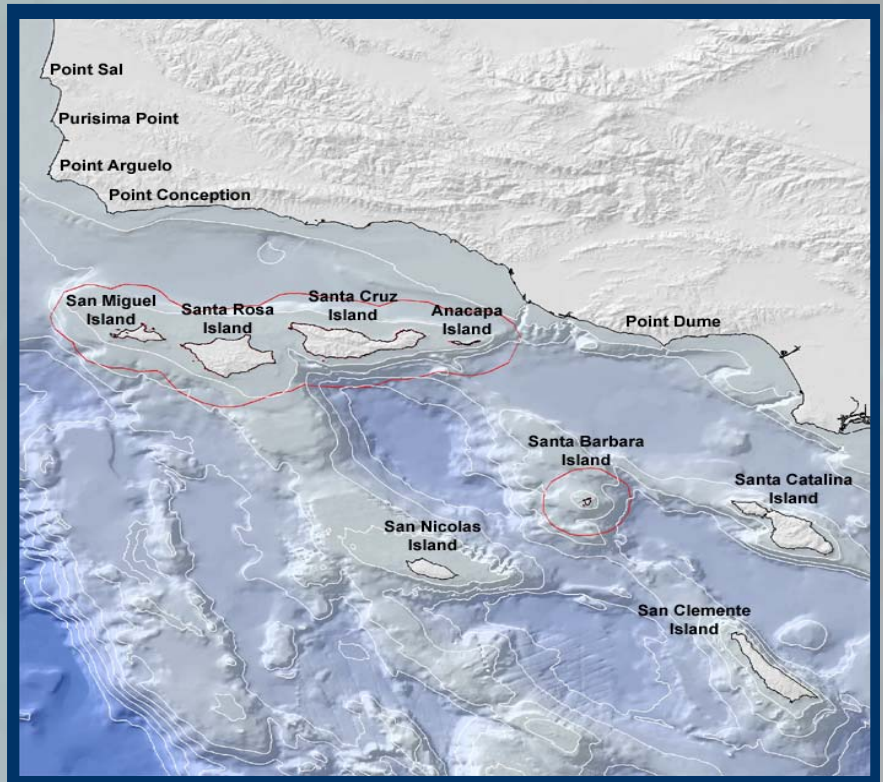
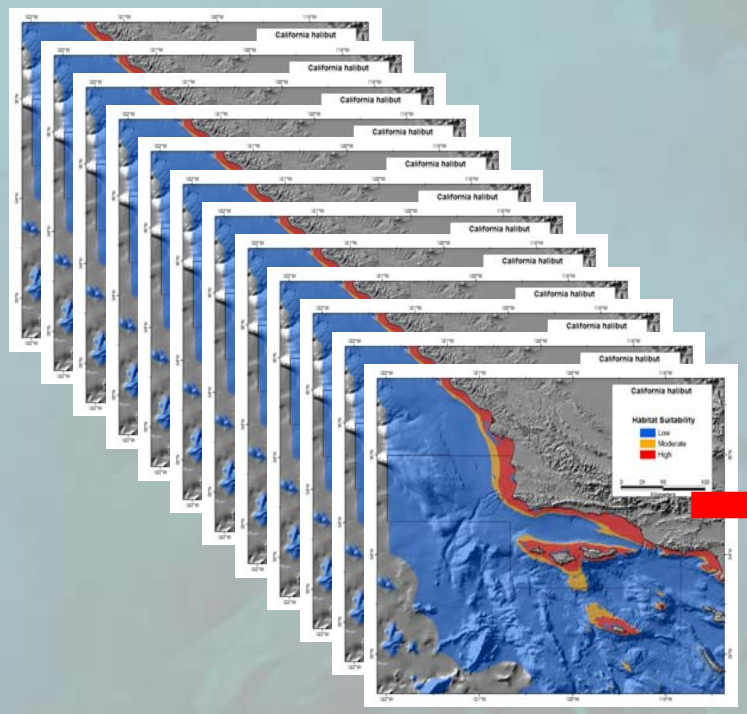
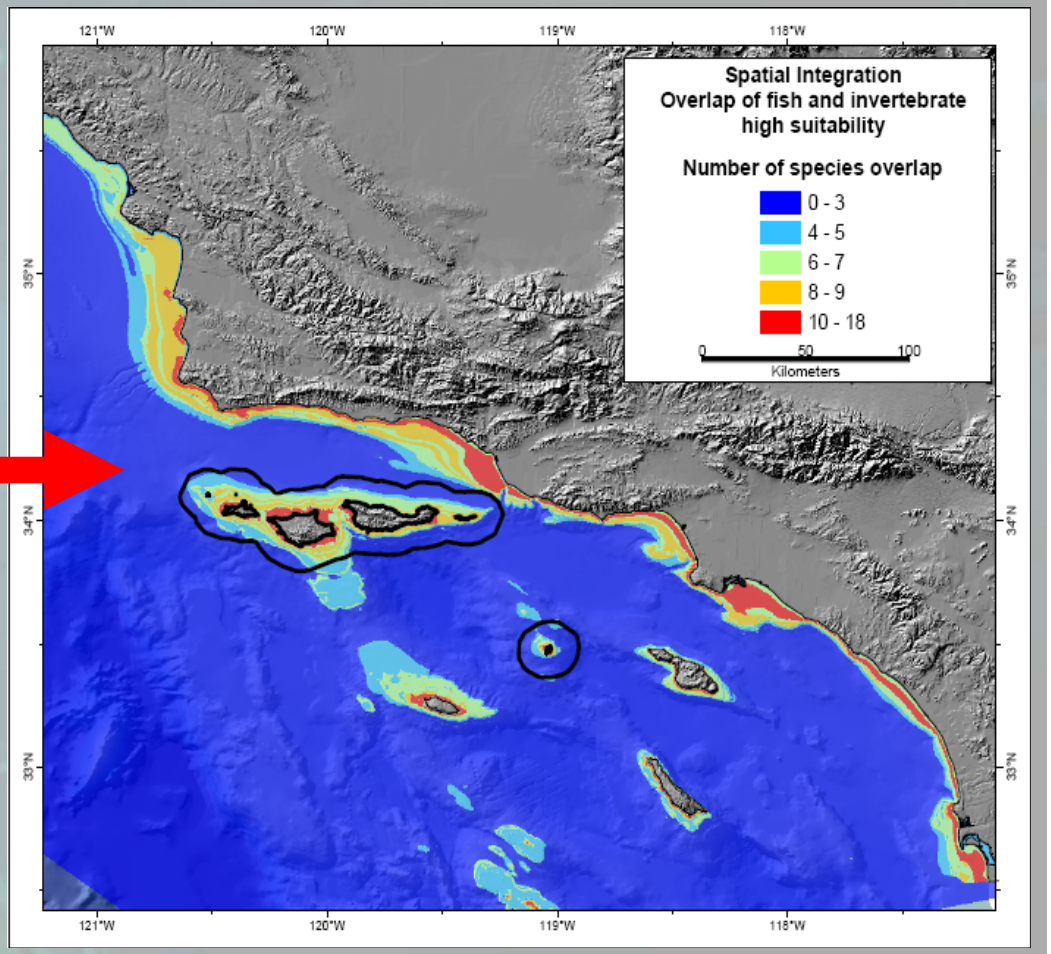
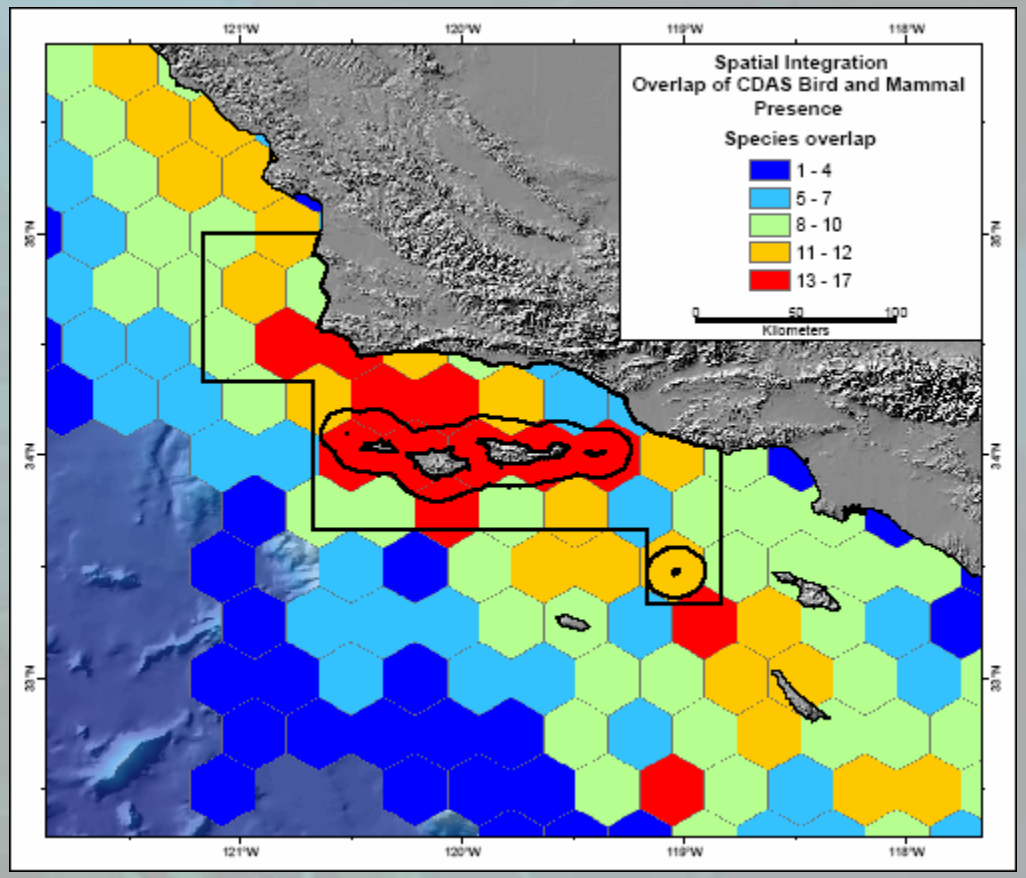


Overall Integration

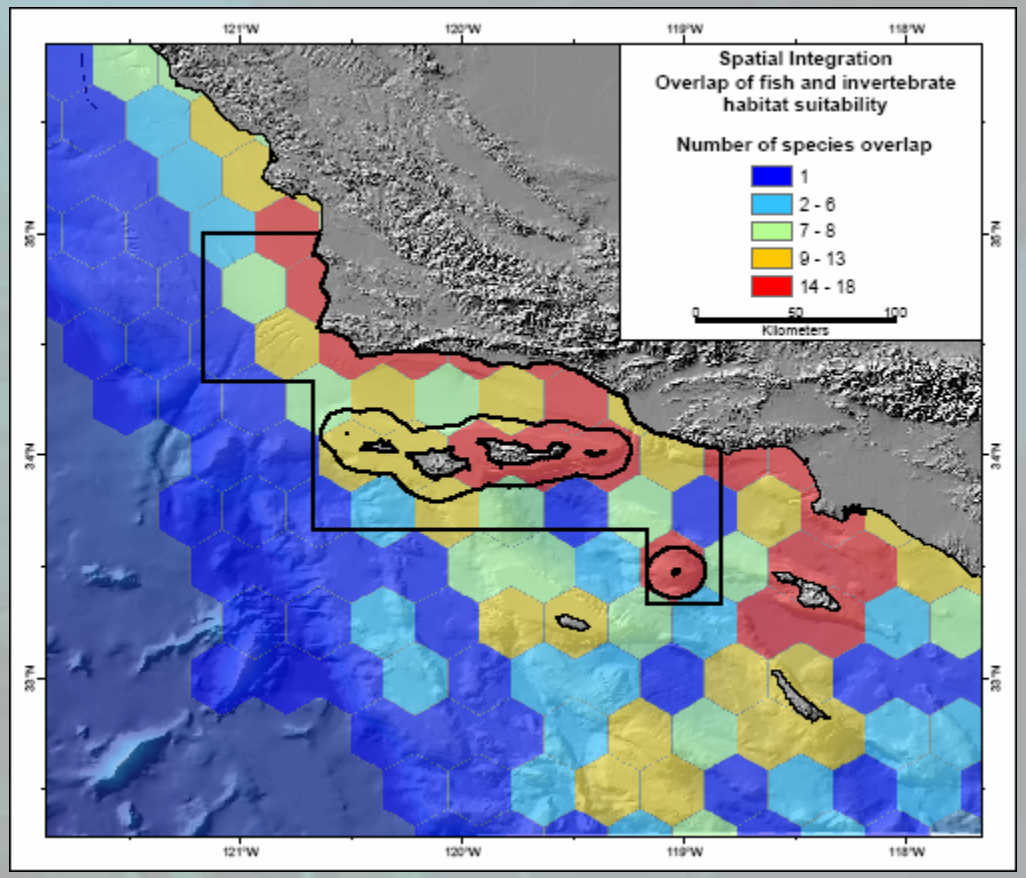




Bird & Mammal Integration

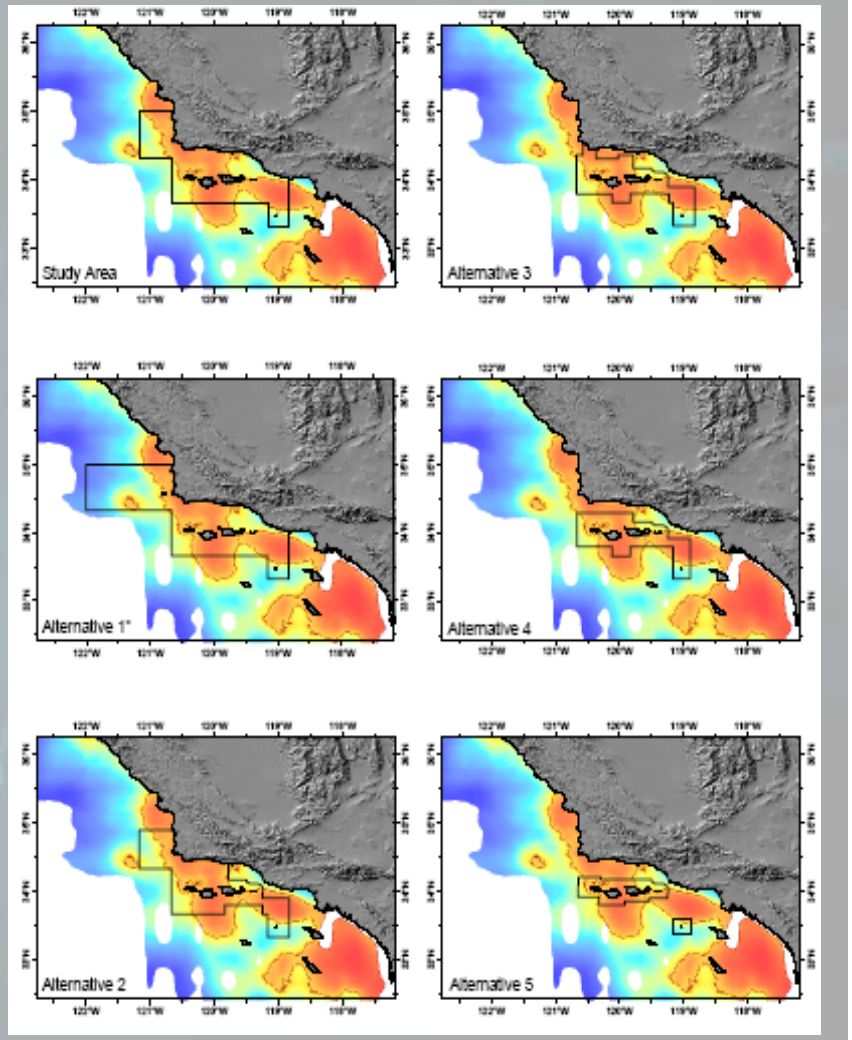


Fish & Invertebrate Integration



Overall Integration

Alternative	Sum Ranks	Mean Ranks	Final Ranks
NAA	-	-	-
5	371	5. 9	7
4	359	5.7	6
3	262	4.2	5
2	185	2.9	2
1a	247	3.9	4
1	246	3.9	3
Study Area	**129**	**2.0**	**1**



Next Steps

- Submit final draft to reviewers first week in June 2005
- Incorporate comments, compile metadata, format, send to printers
- Products: Hardcopy report followed by a CD including map files, limited data, all associated text & metadata
- Availability: all interested parties via hardcopy report, CD or Biogeography Team website

Extended Team

Many thanks to all for the warm Santa Barbara welcome

Airame, Satie
Allen, Jim
Barlow, Jay
Barnes, Tom
Barsky, Kristine
Blanchette, Carol
Brooks, Andy
Calambokidis, John
Carter, Harry
Caselle, Jenn
Charter, Rich
Clarke, Liz
Crook, Steve
Delong, Robert
Dugan, Jenny
Dunaway, Mary Elaine
Engle, Jack
Estes, Jim
Fangman, Sarah
Ford, Glen
Gaines, Steve
Gleason, Mary
Haaker, Pete
Holbrook,Sally
Hunt, George
Keeling, Shanta
Kenner, Mike
Kinlan, Brian
Kushner, David
Leeworthy, Bob
Love, Milton
Maas, Terry
McChesney, Gery
McCrary, Mike
McCutchan, Michelle
Merrifield, Matt
Mizrock, Sally
Murray, Steven
Ono, Dave
Pattengill-Semens, Christie
Piltz, Fred
Pondella, Dan
Ralston, Steve
Reilly, Paul
Richards, Dan
Richards, John
Roberts, Ed
Roy, Kaustov
Schroeder, Donna
Schroeter, Steve
Scott, Paul
Senyck, Natalie
Shane, Mike
Stone, Alex
Stumpf, Rick
Sweetnam, Dale
Takekawa, John
Taniguchi, Ian
Turk, Teresa
Ugoretz, John
Waltenberger, Ben
Warner, Bob
Washburn, Libe
Wilson, Mchelle
Worcester, Karen
Wright, Nancy
Yoklavich, Mary